

REMARKS AND ARGUMENTS

A. Claim Status

Claims 29-42, 52, and 56 are pending in the application.

Claims 29-42, 52, and 56 were rejected under 35 U.S.C. § 112, first paragraph (written description).

Claims 29-42, 52, and 56 were rejected under 35 U.S.C. § 112, second paragraph (definiteness).

Claims 29-42, 52, and 56 were rejected under 35 U.S.C. § 103 (a).

Claim 52 was rejected under 35 U.S.C. § 102 (b).

B. Amendments

Claims 29 and 52 have been amended.

C. Interview

On July 29, 2003, a telephone interview was conducted with Examiner and Applicants' Agents to discuss the instant Final Office Action. In particular, the discussion addressed the art of processing algae material; and some of the differences between the commercial alginate and commercial alginate purification processes of the prior art, and the algae material and purification process of the invention.

D. Arguments

1. Rejections based on 35 U.S.C. § 112, first paragraph (written description)

Claims 29-42, 52, and 56 were rejected under 35 U.S.C. § 112, first paragraph. (written description). Applicants respectfully traverse this rejection, as it appears to be based on misapprehensions about the scope and meaning of the claims, the specification, as well as the understanding of those in the art regarding algae processing and alginate purification. In particular, the instant objection appears to be based on the misapprehension of the words "suspension," "solution," and "extracting" (or "extraction"), all of which are used in the specification and claims in accordance with their plain and ordinary meaning.

It is respectfully suggested that one of ordinary skill and familiar with the art would understand that the alginate is being extracted into solution from the algae material.

Regardless, Claim 29 has been amended to address the examiner's concerns. No new matter has been introduced by this amendment, nor has the scope of the claims been narrowed. Support for this amendment may be found throughout the specification, *inter alia*, at p. 13, last line through p. 14, second paragraph; page 7, fourth paragraph through page 8, second paragraph. p. 7, third paragraph; p. 4, last paragraph, first sentence; p. 3, last paragraph, continuing to page 4; p. 1 second paragraph, especially the last sentence, p. 5, second paragraph through p. 7, second paragraph.

For example, at page 14, first paragraph, it is made clear that after the complex-forming agent (EDTA in this example) is added, the solid matter is allowed to settle, the supernatant is decanted off, and the supernatant is then filtered through a series filters of decreasing pore sizes, with the last pore size being 0.1 μm . With a pore size this small, the liquid passing through the filter - the filtrate - would be understood by those of ordinary skill in the art to be a solution containing dissolved alginate.

The next paragraph then begins with the statement "The addition of salt to the filtrate then follows." This and the following paragraphs through p. 16, second paragraph, convey to one of ordinary skill that the subsequent processing is done with the filtrate - that is to say a now filtered solution.

Additionally, applicants respectfully submit that those of ordinary skill in the art, reading the application, would understand that when a complex-forming agent such as EDTA is added to alginate, the complex-forming agent removes multivalent cations from the algae material, which are then replaced in the algae material by monovalent cations. The resulting alginate, containing monovalent cations, is water-soluble.

Finally, the examiner has correctly noted that Claim 52 contains a typographical error, and incorrectly recites the value of 350 kD. This has been amended to recite a mean molecular

weight of the mixed polymer greater than about 250 kD. This amendment is supported in the specification at p. 9, line 15; again, no new matter has been introduced.

All of the reasons for the written description requirement rejections having been addressed or rendered moot, applicants respectfully request that these rejections be withdrawn.

2. Rejections based on 35 U.S.C. § 112, second paragraph (definiteness)

Claims 29-42, 52, and 56 were rejected under 35 U.S.C. § 112, second paragraph, based on the phrase “extracting an algae material... for providing a solution containing solved alginate...” Applicants respectfully traverse this rejection as above, and submit that claim 29 as amended further alleviates any concerns regarding alleged indefiniteness. Therefore, Applicants respectfully request that this rejection be withdrawn.

3. Rejections based on 35 U.S.C. § 103.

Claims 29-42, 52 and 56 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Zimmermann et. al. (DE 42 04 012 A1) or Klöck et. al. (AP). Applicants respectfully traverse this rejections. As noted above, this rejection was based on the misapprehension that claim 29 as drafted could be read to include the purification of stably solid alginate by dissolution of contaminant solid matter, i.e. the acid treatment of chemically modified alginate beads as disclosed in these references.

As recited in claim 29, the starting material is a raw algae material. Treatment with a complex forming agent causes some of the alginate to dissolve, and impurities remain in the solid matter. (See current specification, p. 7, third paragraph; p. 4, last paragraph, first sentence; p. 3, last paragraph, continuing to page 4; p. 1 second paragraph, especially the last sentence, p. 5, second paragraph through p. 7, second paragraph). This is antithetical to the prior art, where the contaminants are dissolved to leave solid alginate

In particular, one of ordinary skill in the art could not have been motivated by anything in the Zimmerman & Klöck references to purify algae material using a complex forming agent, as these

references relate to the acid washing/chemical treatment of solid alginate beads to degrade the contaminants into the then discarded solution. In these references, commercial alginate is first precipitated into solid beads with barium chloride. To purify this solid alginate, it is incubated with a strong acid solution at a high temperature. According to the reference, the acids dissolve the contaminants, purifying the alginate.

For example, the Klöck reference teaches that “the contaminants were eluted by treatment of [the] Ba^{2+} [alginate] beads using different reagents followed by ethanol extraction.” (Klöck, p. 640, first column, lns. 16-25). In particular, the alginate beads are suspended in “4.5 [liters] of 1 N acetic acid” and incubated for 14 hours to remove impurities. (Id., lns. 26-34). These alginate beads are not dissolved until the barium is removed, and EDTA is used only in this final recovery step, to dissolve and recover the alginate from the by then acid purified, solid barium alginate. (Id., lns. 45-52.)

In sum, these references teach that alginate purity is improved when contaminants are dissolved in acid while the alginate remains solid. In contrast, the present invention contradicts this teaching: the alginate is dissolved while the contaminants remain in the solid and are removed by filtration. Since there is nothing in the references to motivate one of ordinary skill in the art to try the process of the present invention, Applicants respectfully request that this rejection be withdrawn and the claims allowed.

4. Rejection based on 35 U.S.C. § 102 (b).

Claim 52 was rejected under 35 U.S.C. § 102 (b) as being anticipated by Balz et. al. (US 5,132,295), based on the assumption that the alginates of Balz would inherently have the same composition of the present invention. Applicants respectfully traverse this rejection.

Claim 52 is a product-by-process claim, and the product alginate is produced by a completely different process than the alginate produced in Balz. For example, in Balz the alginate is put into solution using a strong base, sodium hydroxide, and no complex-forming agent is used. Further, it is then precipitated using calcium ions, which it should be noted, can be incorporated into the alginate. See, e.g. Klöck et. al, p. 639, last paragraph. The precipitate is then subjected to highly

acidic conditions. Given these differences, the alginate of the Balz reference cannot be assumed to necessarily have the same inherent properties as the alginate of claim 52. Applicants respectfully request that this rejection be withdrawn.

E. Conclusion

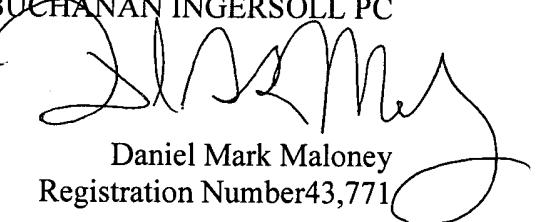
Applicants believe that the foregoing amendments and remarks have overcome or rendered moot all grounds for rejection and objection, and that the application is in a condition for allowance. Applicants therefore respectfully request prompt action on the claims and allowance of the application. If the Examiner believes that personal communication will expedite prosecution of the application, the Examiner is invited to telephone Applicants' undersigned agent directly.

AUTHORIZATION

Applicants believe that no extension of time is required to make submission of the response timely. However, in the event that an extension of time is required, Applicants hereby submit a petition for such extension of time as may be necessary to make this response timely. The Commissioner is hereby authorized to charge any necessary additional fees for extension of time or additional claims to deposit account No. 502194. A duplicate of this Authorization is enclosed.

Respectfully Submitted,

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